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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/530,666	04/06/2005	Yingjie Gao	112740-1067	7634
29177	7590	11/07/2007		
BELL, BOYD & LLOYD, LLP			EXAMINER	
P.O. BOX 1135			SINGH, HIRDEPAL	
CHICAGO, IL 60690				
			ART UNIT	PAPER NUMBER
			2611	
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/530,666	Applicant(s) GAO ET AL.	
	Examiner Hirdepal Singh	Art Unit 2611	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 06 April 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 9-16 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 9-16 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 06 April 2005 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>04/06/2005</u> | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. This action is in response to the filing date of April 06, 2005. Claims 9-16 are pending and have been considered below.

Drawings

2. The drawing figure 1 is objected to because there are no labels for blocks 1-11. These blocks need to have descriptive labels under 37 CFR 1.84(n) and 1.84(o). For example, "D/A" may be used for the label of block number 11.

Specification

3. The disclosure is objected to because of the following informalities: In paragraph 0044 of the disclosure Applicant describes an A/D converter without referring to a block number in the figure, Examiner believes that it should be block no. 8 in figure 1, and use this assumption in the office action below.

Appropriate correction is required.

Claim Rejections - 35 USC § 112

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

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The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. Claim 16 recites the limitation " a multiplier for multiplication...wherein the reference table contains... " in line 7. There is insufficient antecedent basis for this limitation in the claim. No "reference table" is described in this independent claim before.

Claim Rejections - 35 USC § 102

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

7. Claims 9-13 and 16 are rejected under 35 U.S.C. 102(e) as being anticipated by Wright et al. (US 7,058,369).

Regarding claims 9 and 16:

Wright et al discloses a method for adaptive predistortion of digital raw data values for a transmission output stage of a communication appliance, the transmission output stage having a power amplifier (118 in figure 1), and the

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communication appliance being one of a mobile communication terminal and a base station in a mobile radio network (figure 25), the method comprising:

predistorting the raw data values by multiplying the raw data values by predistortion values from a reference table (figure 4) to compensate for amplitude-dependent and phase-dependent distortion in the power amplifier (column 4, lines 30-55), wherein the reference table contains an association between amplitudes of the raw data values and predistortion values (column 10, lines 50-60);

feeding back output signal values from the power amplifier to an adaptation unit (130 in figure 1);

passing the raw data values to the adaptation unit (130 in figure 1 and 4);

comparing, in the adaptation unit, raw data values and output signal values (130 in figures 1 and 4; compare and estimate in figure 4) that correspond to one another in time to assess the distortion in the power amplifier; and

adapting the reference table, based on results from step of comparing (look up table in figure 4; column 10, lines 34-45), during operation of the power amplifier;

wherein the adaptation unit operates discontinuously (column 20, lines 20-38; column 28, lines 58-67; column 19, lines 20-26; column 21, lines 40-50 "the adaptation is implemented in time window i.e. for a time with gaps to ease the computation in adaptive estimator") and the predistortion values in the reference table are interpolated or extrapolated (column 38, lines 30-54, the lookup table entries are inserted, copied and estimated even when the real time update of look up table is not done) at least for raw data values which do not occur.

Regarding claim 10:

Wright et al discloses all of the subject matter as described above and further discloses that the adaptation is carded out within time windows based on the results from the step of comparing (column 20, lines 24-34).

Regarding claim 11:

Wright et al discloses all of the subject matter as described above and further discloses that the method comprising defining an interval between successive time windows is defined as a function of external parameters (column 18, lines 1-10 a non real time process comparing portions of input signal i.e. no continuous adaptation, that means the previous parameters influence the adaptation) which influence the distortion in the power amplifier and of any desired interference suppression.

Regarding claim 12:

Wright et al discloses all of the subject matter as described above and further discloses that the method further comprising:

calculating a polynomial or set or series for the amplitudes of the output signal values as a function of the amplitudes of the raw data values for each time window (column 20 , lines 1-21); and

determining the predistortion values in the reference table based on the function values of the polynomial (column 20, lines 24-45).

Regarding claim 13:

Wright et al discloses all of the subject matter as described above and further discloses that the polynomial is calculated based on a predetermined number of mutually adjacent amplitude intervals of the raw data values (column 13, lines 5-25 input and output magnitudes are compared to calculate predistortion), and wherein each amplitude interval is associated with a mean value for the raw data values which occur in the respective amplitude interval and with a mean value of the associated output signal values (figure 4 clearly shows the calculation of mean value of raw data and output; column 11, lines 35-52).

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. Claim 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over Wright et al. (US 7,058,369) in view of Blauvelt (US 6,288,814).

Regarding claim 14:

Wright et al discloses all of the subject matter as described above except for specifically teaching that the real predistortion values are used for processing.

However, Blauvelt in the same field of endeavor discloses a system and method for predistortion in wireless communication where real predistortion (16 in figure 1) values are used for processing.

Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to use real predistortion values for processing in order to get the distortion that is real and independent of frequency components as taught by Blauvelt.

10. Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over Wright et al. (US 7,058,369) in view of Nguyen et al. (US 2003/0169108).

Regarding claim 15:

Wright et al discloses all of the subject matter as described above except for specifically teaching that complex predistortion values are used for processing.

However, Nguyen et al in the same field of endeavor discloses a system and method for predistortion in wireless communication where complex (22, 24 and 58 in figure 1; paragraph 0024) predistortion values are used for processing.

Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to use complex predistortion values for processing in order to take advantage associated with the complex signal processing as it reduces the processing time in the adaptive predistorter as taught by Nguyen.

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Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Hirdepal Singh whose telephone number is 571-270-1688. The examiner can normally be reached on Mon-Fri (Alternate Friday Off) 8:00AM-5:00PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Shuwang Liu can be reached on 571-272-3036. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

HS
October 31, 2007


SHUWANG LIU
SUPERVISORY PATENT EXAMINER